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EXAMINER	
TORRES, JOSEPH D	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

MN

Office Action Summary	Application No.	Applicant(s)	
	10/815,133	XIA ET AL.	
	Examiner	Art Unit	
	Joseph D. Torres	2112	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 September 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,6,7,10-16,18,20,21 and 30-38* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6,7,10-16,18,20,21 and 30-38* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *06/29/2007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claims 1-4, 6, 7, 10-16, 18, 20, 21 and 30-38 are objected to because of the following informalities: claims 1, 15 30 and 34 refer to elements, such as Appendix A, not having antecedent basis in the claims as pointed out in the last Office Action. 37 CFR 1.75 states "a claim may not contain any other parts of the application or other material". MPEP 608.01(m) states "Reference characters corresponding to elements recited in the detailed description and the drawings may be used in conjunction with the recitation of the same element or group of elements in the claims. The reference characters, however, should be enclosed within parentheses so as to avoid confusion with other numbers or characters, which may appear in the claims. The use of reference characters is to be considered as having no effect on the scope of the claims".

The term "Appendix A" should be removed from the claim since if it is included in parenthesis it will be "considered as having no effect on the scope of the claims" and will not be given patentable weight. In addition, simply placing Appendix A in parenthesis would lead to indefinite grammatical structure.

Appropriate correction is required.

Claims 7 and 33 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s)

in proper dependent form, or rewrite the claim(s) in independent form. A matrix H and its transpose are substantially identical structures. That is storing a matrix H is identical to storing its transpose since the transpose of the transpose of matrix H is matrix H.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-4, 6, 7, 10-16, 18, 20, 21 and 30-38 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 30 recite, "a computer readable storage medium storing at least a first portion of a parity check matrix, wherein said parity check matrix is substantially as described in Appendix A and said first portion includes at least half of said parity check matrix", which is indefinite since as pointed out in the previous Office Action, there is no antecedent basis in the claims for "Appendix A". 37 CFR 1.75 states "a claim may not contain any other parts of the application or other material". MPEP 608.01(m) states "Reference characters corresponding to elements recited in the detailed description and the drawings may be used in conjunction with the recitation of the same element or group of elements in the claims. The reference characters, however, should be enclosed within parentheses so as to avoid confusion with other numbers or characters, which may appear in the claims. **The use of reference characters is to be considered as having no effect on the scope of the claims**". That is, no patentable

weight can be given to references corresponding to elements recited in the detailed description and the drawings. Hence simple recitation of Appendix A cannot provide antecedent basis for the material from Appendix A that the Applicant is attempting to claim. As such claims 1 and 30 remain indefinite. Furthermore, Appendix A does not teach a matrix but a list form of a matrix; hence it is not clear what the Applicant is attempting to claim. Furthermore Appendix does not provide any description; hence "as described in Appendix A" is not clear what is being stored.

Claim 15 recites, "accessing a computer readable storage medium storing a representation of at least a first portion of a parity check matrix, wherein said parity check matrix is substantially as described in Appendix A and said first portion includes at least half of said parity check matrix", which is indefinite since as pointed out in the previous Office Action, there is no antecedent basis in the claims for "Appendix A". 37 CFR 1.75 states "a claim may not contain any other parts of the application or other material". MPEP 608.01(m) states "Reference characters corresponding to elements recited in the detailed description and the drawings may be used in conjunction with the recitation of the same element or group of elements in the claims. The reference characters, however, should be enclosed within parentheses so as to avoid confusion with other numbers or characters, which may appear in the claims. **The use of reference characters is to be considered as having no effect on the scope of the claims**". That is, no patentable weight can be given to references corresponding to elements recited in the detailed description and the drawings. Hence simple recitation

of Appendix A cannot provide antecedent basis for the material from Appendix A that the Applicant is attempting to claim. As such claims 1 and 30 remain indefinite. Furthermore, Appendix A does not teach a matrix but a list form of a matrix; hence it is not clear what the Applicant is attempting to claim. Furthermore Appendix does not provide any description; hence "as described in Appendix A" is not clear what is being stored.

Claim 34 recites, "wherein said parity check matrix is substantially as described in Appendix A and said first portion includes at least half of said parity check matrix", which is indefinite since as pointed out in the previous Office Action, there is no antecedent basis in the claims for "Appendix A". 37 CFR 1.75 states "a claim may not contain any other parts of the application or other material". MPEP 608.01(m) states "Reference characters corresponding to elements recited in the detailed description and the drawings may be used in conjunction with the recitation of the same element or group of elements in the claims. The reference characters, however, should be enclosed within parentheses so as to avoid confusion with other numbers or characters, which may appear in the claims. **The use of reference characters is to be considered as having no effect on the scope of the claims**". That is, no patentable weight can be given to references corresponding to elements recited in the detailed description and the drawings. Hence simple recitation of Appendix A cannot provide antecedent basis for the material from Appendix A that the Applicant is attempting to claim. As such claims 1 and 30 remain indefinite. Furthermore, Appendix A does not

teach a matrix but a list form of a matrix; hence it is not clear what the Applicant is attempting to claim. Furthermore Appendix does not provide any description; hence "as described in Appendix A" is not clear what is being stored.

Newly amended dependant claim 4, 6, 7, 18, 32, 33 and 37 all refer back to portions of the parity check matrix or the Parity check matrix from claims 1, 15, 30 and 34, hence suffer from the same lack of antecedent basis problems as claims 1, 15, 30 and 34.

Response to Arguments

Applicant's arguments filed 09/06/2007 have been fully considered but they are not persuasive.

The Applicant contends, "Neither Yang et al. nor Lu et al. discloses or suggests, either alone or in combination, "a computer readable storage medium storing at least a first portion of a parity check matrix, wherein said parity check matrix is substantially as described in Appendix A and said first portion includes at least half of said parity check matrix".

37 CFR 1.75 states "a claim may not contain any other parts of the application or other material". MPEP 608.01(m) states "Reference characters corresponding to elements recited in the detailed description and the drawings may be used in conjunction with the recitation of the same element or group of elements in the claims. The reference characters, however, should be enclosed within parentheses so as to

avoid confusion with other numbers or characters, which may appear in the claims. **The use of reference characters is to be considered as having no effect on the scope of the claims**". That is, no patentable weight can be given to references corresponding to elements recited in the detailed description and the drawings. Hence simple recitation of Appendix A cannot provide antecedent basis for the material from Appendix A that the Applicant is attempting to claim. As such claims 1 and 30 remain indefinite. Furthermore, Appendix A does not teach a matrix but a list form of a matrix; hence it is not clear what the Applicant is attempting to claim. Furthermore Appendix does not provide any description; hence "as described in Appendix A" is not clear what is being stored.

Section 4.1 on page 1418 of Yang teaches that the parity matrix H can be generated using compute code, a coded listing. Such a listing clearly suggest computer readable media for buffering and/or storing. As per the material in Appendix A, no patentable weight is given to the term Appendix A.

The Applicant contends, "Claims 2, 4, 6-7, and 10, claims 16, 18 and 20, and claims 35-38 are dependent claims that depend either directly or indirectly from independent claims 1, 15, and 34, respectively. Consequently, these claims are allowable for at least the same reasons as their corresponding base claims. These claims also provide further bases for patentability. For example, claim 4 further defines the "first portion of said parity check matrix" of claim 1 as being "a portion that includes columns of said parity check matrix having a column weight of 4.""

Section 4.1 on page 1418 of Yang teaches arbitrary weight w columns.

The Applicant contends that Claims 7 and 33 "further defines the "storage medium" of claim 1 as storing the first portion of the parity check matrix as a matrix transpose.""

A matrix H and its transpose are substantially identical structures. That is storing a matrix H is identical to storing its transpose since the transpose of the transpose of matrix H is matrix H.

The Examiner disagrees with the applicant and maintains all rejections of claims 1-4, 6, 7, 10-16, 18, 20, 21 and 30-38. All amendments and arguments by the applicant have been considered. It is the Examiner's conclusion that claims 1-4, 6, 7, 10-16, 18, 20, 21 and 30-38 are not patentably distinct or non-obvious over the prior art of record in view of the references, Yang (Michael Yang, Yan Li and William E. Ryan; Design of Efficiently Encodable Moderate-Length High-Rate Irregular LDPC Codes; Proceedings of the Annual Conference on Communication, Control and Computing, October 2, 2002, pages 1415-1424) [hereafter referred to as Yang] in view of Lu et al. (Ben Lu, Xiaodong Wang, and Krishna R. Narayanan; LDPC-Based Space–Time Coded OFDM Systems Over Correlated Fading Channels: Performance Analysis and Receiver Design; IEEE TRANSACTIONS ON COMMUNICATIONS, VOL. 50, NO. 1, JANUARY 2002, pages 74-88) [hereafter referred to as Lu] in view of Goldstein; Yuri et al. (US 6862552 B2, hereafter referred to as Goldstein) in view of Dougherty; Angus O. et al. (US 6831902

B1, hereafter referred to as Dougherty) in view of Bordogna; Mark Aldo et al. (US 6683855 B1, hereafter referred to as Bordogna) in further view of Brankovic; Veselin (US 6198460 B1) as applied in the last office action, filed 05/04/2007. Therefore, the rejection is maintained.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

1. Claims 1, 2, 4, 6, 7, 10, 15, 16, 18, 20 and 34-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yang (Michael Yang, Yan Li and William E. Ryan; Design of Efficiently Encodable Moderate-Length High-Rate Irregular LDPC Codes; Proceedings of the Annual Conference on Communication, Control and Computing, October 2, 2002, pages 1415-1424) [hereafter referred to as Yang] in view of Lu et al. (Ben Lu, Xiaodong Wang, and Krishna R. Narayanan; LDPC-Based Space–Time

Coded OFDM Systems Over Correlated Fading Channels: Performance Analysis and Receiver Design; IEEE TRANSACTIONS ON COMMUNICATIONS, VOL. 50, NO. 1, JANUARY 2002, pages 74-88) [hereafter referred to as Lu].

35 U.S.C. 103(a) rejection of claims 1, 15 and 34.

Yang teaches a forward error correction FEC coder to encode digital data using a low density parity check LDPC code (Figure 1(a) on page 1420 in Yang), said FEC coder including: a matrix multiplication unit to multiply input data by a transpose of a first portion of a parity check matrix to generate modified data (H_1^T block in Figure 1(a) on page 1420 in Yang and Equation 4 on page 1418 of Yang); a differential encoder to differentially encode said modified data to generate coded data ($\frac{1}{1 \oplus D}$ block on pager 1420 of Yang; also see last two paragraphs on page 1419 of yang); and a concatenation unit to concatenate the input data and the coded data to form a code word (Figure 1(a) on page 1420 in Yang teaches that a codeword c is comprised of the input bits concatenated with the parity bits, which clearly suggests a concatenation unit). However Yang does not explicitly teach the specific use of a wireless transmitter to transmit a wireless signal that includes said code word.

Lu, in an analogous art, teaches use of a wireless transmitter to transmit a wireless signal that includes said code word (Abstract in Lu). Lu teaches that use of LDPC coding for wireless OFDM systems can significantly improve system performance by exploiting both spatial diversity and selective fading diversity (Abstract in Lu). The Top

of column 2 on page 74 in Lu teaches that antenna array spatial diversity and channel coding can provide significant capacity gains in wireless communications.

37 CFR 1.75 states "a claim may not contain any other parts of the application or other material". MPEP 608.01(m) states "Reference characters corresponding to elements recited in the detailed description and the drawings may be used in conjunction with the recitation of the same element or group of elements in the claims. The reference characters, however, should be enclosed within parentheses so as to avoid confusion with other numbers or characters, which may appear in the claims. **The use of reference characters is to be considered as having no effect on the scope of the claims**". That is, no patentable weight can be given to references corresponding to elements recited in the detailed description and the drawings. Hence simple recitation of Appendix A cannot provide antecedent basis for the material from Appendix A that the Applicant is attempting to claim. As such claims 1 and 30 remain indefinite. Furthermore, Appendix A does not teach a matrix but a list form of a matrix; hence it is not clear what the Applicant is attempting to claim. Furthermore Appendix does not provide any description; hence "as described in Appendix A" is not clear what is being stored.

Section 4.1 on page 1418 of Yang teaches that the parity matrix H can be generated using compute code, a coded listing. Such a listing clearly suggest computer readable media for buffering and/or storing. As per the material in Appendix A, no patentable weight is given to the term Appendix A.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Yang with the teachings of Lu by including use of a wireless transmitter to transmit a wireless signal that includes said code word. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of a wireless transmitter to transmit a wireless signal that includes said code word would have provided improved system performance by exploiting both spatial diversity and selective fading diversity (Abstract in Lu) and significant capacity gains from antenna array spatial diversity and channel coding (Top of column 2 on page 74 in Lu).

35 U.S.C. 103(a) rejection of claims 2, 16 and 35.

Abstract in Lu.

35 U.S.C. 103(a) rejection of claims 4, 18 and 37.

Section 4.1 on page 1418 of Yang teaches arbitrary weight w columns.

35 U.S.C. 103(a) rejection of claims 6 and 36.

The H_1^T block in Figure 1(a) on page 1420 in Yang clearly suggfests a mechanism for storing information about the parity check matrix so that H_1^T can be used to generate codewords.

35 U.S.C. 103(a) rejection of claim 7.

Since H_2 on page 1419 of Yang is substantially is substantially a Tanner Graph; H_1^T substantially defines the parity matrix H in Equation 5 on page 1419. Note also: A in the last paragraph on page 1419 of Yang is and LDPC for Figure 1(b) on page 1420 in Yang. In addition, a matrix H and its transpose are substantially identical structures. That is storing a matrix H is identical to storing its transpose since the transpose of the transpose of matrix H is matrix H.

35 U.S.C. 103(a) rejection of claims 10, 20 and 38.

The last paragraph on page 1416 of Yang teaches an arbitrary size (k, n) LDPC codes, which encompasses a particular (1600,2000) code.

2. Claims 3 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yang (Michael Yang, Yan Li and William E. Ryan; Design of Efficiently Encodable Moderate-Length High-Rate Irregular LDPC Codes; Proceedings of the Annual Conference on Communication, Control and Computing, October 2, 2002, pages 1415-1424) [hereafter referred to as Yang] and Lu et al. (Ben Lu, Xiaodong Wang, and Krishna R. Narayanan; LDPC-Based Space–Time Coded OFDM Systems Over Correlated Fading Channels: Performance Analysis and Receiver Design; IEEE TRANSACTIONS ON COMMUNICATIONS, VOL. 50, NO. 1, JANUARY 2002, pages 74-88) [hereafter referred to as Lu] in view of Goldstein; Yuri et al. (US 6862552 B2, hereafter referred to as Goldstein).

35 U.S.C. 103(a) rejection of claims 3 and 21.

Yang and Lu substantially teaches the claimed invention described in claims 1 and 2 (as rejected above).

In addition, Yang and Lu teach a mapper, between said FEC coder and said wireless transmitter, to map said code word based on a predetermined modulation scheme (column 2, page 74 of Lu).

However Yang and Lu do not explicitly teach the specific use of an inverse discrete Fourier transform unit to convert mapped data from a frequency domain representation to a time domain representation.

Goldstein, in an analogous art, teaches use of an inverse discrete Fourier transform unit to convert mapped data from a frequency domain representation to a time domain representation (IFFT 16 in Figure 2 of Goldstein).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Yang and Lu with the teachings of Goldstein by including use of an inverse discrete Fourier transform unit to convert mapped data from a frequency domain representation to a time domain representation. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of an inverse discrete Fourier transform unit to convert mapped data from a frequency domain representation to a time domain representation would have provided signal samples results in the time domain (col. 3, lines 45-50 in Goldstein).

3. Claims 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yang (Michael Yang, Yan Li and William E. Ryan; Design of Efficiently Encodable Moderate-Length High-Rate Irregular LDPC Codes; Proceedings of the Annual Conference on Communication, Control and Computing, October 2, 2002, pages 1415-1424) [hereafter referred to as Yang] and Lu et al. (Ben Lu, Xiaodong Wang, and Krishna R. Narayanan; LDPC-Based Space–Time Coded OFDM Systems Over Correlated Fading Channels: Performance Analysis and Receiver Design; IEEE TRANSACTIONS ON COMMUNICATIONS, VOL. 50, NO. 1, JANUARY 2002, pages 74-88) [hereafter referred to as Lu] in view of Dougherty; Angus O. et al. (US 6831902 B1, hereafter referred to as Dougherty).

35 U.S.C. 103(a) rejection of claims 11-13.

Yang and Lu substantially teaches the claimed invention described in claims 1 and 2 (as rejected above).

However Yang and Lu do not explicitly teach the specific use of wireless network components.

Dougherty, in an analogous art, teaches use of wireless network components (col. 1, lines 5-15 in Dougherty).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Yang and Lu with the teachings of Dougherty by including use of wireless network components. This modification would have been obvious to

one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of wireless network components would have provided a wide range of services (col. 1, lines 5-15 in Dougherty).

4. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yang (Michael Yang, Yan Li and William E. Ryan; Design of Efficiently Encodable Moderate-Length High-Rate Irregular LDPC Codes; Proceedings of the Annual Conference on Communication, Control and Computing, October 2, 2002, pages 1415-1424) [hereafter referred to as Yang] and Lu et al. (Ben Lu, Xiaodong Wang, and Krishna R. Narayanan; LDPC-Based Space–Time Coded OFDM Systems Over Correlated Fading Channels: Performance Analysis and Receiver Design; IEEE TRANSACTIONS ON COMMUNICATIONS, VOL. 50, NO. 1, JANUARY 2002, pages 74-88) [hereafter referred to as Lu] in view of Bordogna; Mark Aldo et al. (US 6683855 B1, hereafter referred to as Bordogna).

35 U.S.C. 103(a) rejection of claim 14.

Yang and Lu substantially teaches the claimed invention described in claims 1 and 2 (as rejected above).

However Yang and Lu do not explicitly teach the specific use of an IC.

Bordogna, in an analogous art, teaches use of an IC (col. 9, lines 52-54 in Bordogna).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Yang and Lu with the teachings of Bordogna by including

use of an IC. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of an ASIC would have provided flexibility with the added advantage of speed associa4ted with hardware (col. 9, lines 52-54 in Bordogna).

5. Claims 30-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yang (Michael Yang, Yan Li and William E. Ryan; Design of Efficiently Encodable Moderate-Length High-Rate Irregular LDPC Codes; Proceedings of the Annual Conference on Communication, Control and Computing, October 2, 2002, pages 1415-1424) [hereafter referred to as Yang] in view of Lu et al. (Ben Lu, Xiaodong Wang, and Krishna R. Narayanan; LDPC-Based Space–Time Coded OFDM Systems Over Correlated Fading Channels: Performance Analysis and Receiver Design; IEEE TRANSACTIONS ON COMMUNICATIONS, VOL. 50, NO. 1, JANUARY 2002, pages 74-88) [hereafter referred to as Lu] in further view of Brankovic; Veselin (US 6198460 B1).

35 U.S.C. 103(a) rejection of claim 30.

Yang teaches a forward error correction FEC coder to encode digital data using a low density parity check LDPC code (Figure 1(a) on page 1420 in Yang), said FEC coder including: a matrix multiplication unit to multiply input data by a transpose of a first portion of a parity check matrix to generate modified data (H_1^T block in Figure 1(a) on page 1420 in Yang and Equation 4 on page 1418 of Yang); a differential encoder to

differentially encode said modified data to generate coded data ($\frac{1}{1 \oplus D}$ block on pager 1420 of Yang; also see last two paragraphs on page 1419 of yang); and a concatenation unit to concatenate the input data and the coded data to form a code word (Figure 1(a) on page 1420 in Yang teaches that a codeword c is comprised of the input bits concatenated with the parity bits, which clearly suggests a concatenation unit).

37 CFR 1.75 states "a claim may not contain any other parts of the application or other material". MPEP 608.01(m) states "Reference characters corresponding to elements recited in the detailed description and the drawings may be used in conjunction with the recitation of the same element or group of elements in the claims. The reference characters, however, should be enclosed within parentheses so as to avoid confusion with other numbers or characters, which may appear in the claims. **The use of reference characters is to be considered as having no effect on the scope of the claims**". That is, no patentable weight can be given to references corresponding to elements recited in the detailed description and the drawings. Hence simple recitation of Appendix A cannot provide antecedent basis for the material from Appendix A that the Applicant is attempting to claim. As such claims 1 and 30 remain indefinite. Furthermore, Appendix A does not teach a matrix but a list form of a matrix; hence it is not clear what the Applicant is attempting to claim. Furthermore Appendix does not provide any description; hence "as described in Appendix A" is not clear what is being stored.

Section 4.1 on page 1418 of Yang teaches that the parity matrix H can be generated using compute code, a coded listing. Such a listing clearly suggest computer

readable media for buffering and/or storing. As per the material in Appendix A, no patentable weight is given to the term Appendix A.

However Yang does not explicitly teach the specific use of a wireless transmitter to transmit a wireless signal that includes said code word.

Lu, in an analogous art, teaches use of a wireless transmitter to transmit a wireless signal that includes said code word (Abstract in Lu). Lu teaches that use of LDPC coding for wireless OFDM systems can significantly improve system performance by exploiting both spatial diversity and selective fading diversity (Abstract in Lu). The Top of column 2 on page 74 in Lu teaches that antenna array spatial diversity and channel coding can provide significant capacity gains in wireless communications.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Yang with the teachings of Lu by including use of a wireless transmitter to transmit a wireless signal that includes said code word. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of a wireless transmitter to transmit a wireless signal that includes said code word would have provided improved system performance by exploiting both spatial diversity and selective fading diversity (Abstract in Lu) and significant capacity gains from antenna array spatial diversity and channel coding (Top of column 2 on page 74 in Lu).

However Yang and Lu do not explicitly teach the specific use of a dipole antenna.

Brankovic, in an analogous art, teaches use of a dipole antenna (Abstract in Brankovic).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Yang and Lu with the teachings of Brankovic by including use of a dipole antenna. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of a dipole antenna would have provided micro-wave and millimeter-wave transmission capabilities (Abstract in Brankovic).

35 U.S.C. 103(a) rejection of claim 31.

Abstract in Lu.

35 U.S.C. 103(a) rejection of claim 32.

The H_1^T block in Figure 1(a) on page 1420 in Yang clearly suggests a mechanism for storing information about the parity check matrix so that H_1^T can be used to generate codewords.

35 U.S.C. 103(a) rejection of claim 33.

Claims 4 and 5 fail to further limit claim 1 in a meaningful way, hence; are rejected for the same reasons as claim 1.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph D. Torres whose telephone number is (571) 272-3829. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jacques Louis-Jacques can be reached on (571) 272-6962. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Joseph D. Torres, PhD
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Art Unit 2112